Dysarthria and other-initiated repair in everyday conversation

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Introduction

Dysarthria refers to a motor speech disorder of neurological origin and is common in disorders such as amyotrophic lateral sclerosis (ALS); an acquired progressive neurological disorder, the most common form of which is often referred to as motor neurone disease (MND). People living with ALS (plwALS) develop weakness and spasticity of muscles and, over time, become increasingly paralysed. Approximately 20% of plwALS experience initial changes in the brainstem (bulbar) region of the brain, resulting in dysarthria (McDermott and Shaw, 2008). It is estimated that dysarthria affects 80–95% of plwALS (Tomik and Guiloff, 2010), with speech remaining adequate on average for 18-months from the first bulbar symptoms (Makkonen et al. 2017). Speech symptoms are typically a mixed spastic-flaccid dysarthria characterised by reduced articulatory range, phonatory-weakness, hypernasality and slow rate (Tomik et al. 2015, Lee et al. 2018). The main functional outcome of dysarthria is reduced intelligibility.

In theory, the ability to be understood should decrease in line with the severity of the dysarthria although in reality this can vary in relation to several variables including communication partner familiarity (Hustad, 2008). Thus, in addition to intelligibility as a measure of speech signal effectiveness, comprehensibility has been defined as “the extent to which a listener understands utterances produced by a speaker in a communication context” (Barefoot et al. 1993). Within the field of dysarthria, comprehensibility addresses, in part, the effects of so-called signal-independent variables such as syntax, semantics and physical context, on speech (Yorkston et al. 1996), with the more recent use of understandability (Bloch and Wilkinson, 2004, 2011) addressing the ways in dysarthric speech is understood in the
context of prior turn(s) at talk. The relationship between changes in intelligibility and social interactivity is far from clear, with evidence showing that the two are not well correlated (Bloch and Tuomainen, 2017).

Other-initiated repair

Repair refers to practices used by participants to manage troubles in talk (Schegloff et al. 1977; Schegloff 2000). The term trouble source describes what participants themselves identify as problematic during their own conversation. Of interest here is the practice of other-initiated repair (Schegloff et al. 1977), where one participant (person B) treats something in another participant’s (person A’s) turn as a trouble source. Regularly, though not always, the other initiation of repair functions to highlight some difficulty participant B is having in understanding participant A’s turn (Schegloff, 2007). There are various ways in which such highlighting can be achieved and these are used in a natural order based on their relative strength to locate a repairable (Schegloff et al. 1977). Schegloff (2004) roughly divides other initiation of repairs into those that request a ‘fix’ or those that offer a candidate for confirmation or otherwise. Of the former, Drew (2007) examines open class next turn repair initiators - such ‘what? sorry? huh?’ etc. These are seen as the weakest types of repair initiator given that they do not specify the nature of the trouble, nor its location in the prior turn. They simply signal that something is wrong. It is then up to the speaker of the trouble source to address what might be problematic. What is clear is that other initiations of repair ‘overwhelmingly yield self-corrections’ (Schegloff et al, 1977: 376), and as such the other-initiation itself is only one part of a wider practice of repair. For the practice to be successful there must be some sort of resolution following the initiation. One type of repair practice is termed other-initiated self repair – where
person B initiates repair, and person A attempts to resolve the repair. To date most of the evidence regarding repair has focused on the identification and repair of individual trouble sources (Schegloff, 2000). Inevitably such troubles are resolved within the next few turns following initiation (Schegloff, 1992). However, beyond typical speakers we may usefully consider how repair operates in an environment of disordered or atypical speech or language.

*Dysarthria-in-interaction and repair*

Given the known effects of dysarthria on intelligibility it is no surprise that trouble sources and repair in conversations featuring adults with dysarthric speech have been a considerable focus of attention. It has been demonstrated that trouble sources identified by a recipient using an other initiation of repair are a regular occurrence in conversations featuring speakers with dysarthria (Bloch, 2006; Bloch & Wilkinson, 2004, 2011). The nature of these trouble sources has been analysed both in terms of action (e.g. topic change, Bloch et al 2015), and the relationships between turns or sequentiality (Bloch and Wilkinson, 2009). The common conclusion drawn across analyses is that dysarthria-in-interaction is undoubtedly characterized by troubles with intelligibility: a property of both the speaker and listener (Liss, 2007). Recipients have trouble hearing and understanding people with dysarthric speech. However, in everyday conversation other issues come into play, including how the recipient makes sense of a prior turn when it is not understood; particularly how they display their understanding of the relationship between turns and how this may be used as a resource to re-establish mutual understanding, i.e., intersubjectivity.

A further consideration relates to timing. Timing troubles in turn production and turn transition in augmentative and alternative communication (AAC) have been clearly identified (Higginbotham and Wilkins, 1999) but there is also some evidence
that speakers with even mild dysarthria, in certain circumstances, can also experience specific troubles relating to turn initiation. People with speech initiation difficulties due to Parkinson’s disease, for example, can experience inappropriate overlapping turn onsets midway through an interactant’s turn construction unit (TCU), leading to significant interactional difficulties despite only mild to moderate effects on intelligibility (Griffiths et al. 2012).

One issue that has yet to merit detailed and dedicated analytical attention is the way in which participants manage ongoing problems in talk beyond a single trouble source (although, see Laakso and Klippi, 1999, on aphasia). Preliminary work on an interaction between one woman with ALS and her husband offered insights into three repair sequences in one extended section of talk, each of which relates to utterances produced via an electronic AAC system (Bloch & Wilkinson, 2013). In two of the extracts the result is a prolonged repair sequence due to a failure by the recipient to understand both the initial AAC produced turn and subsequent attempts to clarify the meaning of that turn. The issue here is one of either recycled trouble sources and repair attempts on the same trouble (a repair loop) or a more complex incremental accomplishment of meaning in which the understanding of a problematic turn, or elements within that turn, are achieved in distinct stages over several turns. Severe dysarthria can therefore mean that attempts to resolve trouble sources are likely to become trouble sources in their own right, causing “cascading troubles” (see Kendrick, 2015, p. 167). This may then be compounded by the restricted nature of other-initiated repair as a communicative act. Other-initiations of repair are typically employed as close to the trouble source turn as possible, and have a limited reach backward in prior talk (Schegloff, 1992). If there are problems located further away, or the problems are
more multifaceted, then other practices are likely necessary to unearth and deal with them (Ekberg, 2012).

Complex and cascading troubles matter insofar as they are likely to be an increasing difficulty for certain dyads, particularly with ALS, as they manage the progression of the disease and negotiate the delicate route between the use of natural speech and some form of AAC system. Moreover, these sorts of troubles and repair sequences are possibly characteristic of dysarthria caused by ALS, and are likely to provide detailed insight into the linguistic and communicative practices and lived experiences this communication disorder implicates.

In summary, dysarthria is, at its functional core, a communication disorder of variable intelligibility. Words and utterances are partially or completely not heard or understood. Previous research has usefully explored the nature of individual trouble sources and their resolution but there remains scope for understanding how participants collaboratively manage talk beyond a single trouble source.

The current study aims to examine other-initiation of repair of multiple, cascading trouble sources in everyday conversation involving a man with intelligibility problems arising from ALS. This aim is motivated by a need to establish how multiple trouble sources are managed by participants and how they resolved. The relevance of this work to the fields of clinical linguistics, applied conversation analysis and speech-language pathology is one of furthering our understanding of the impact of dysarthria on everyday interaction and, critically, how this impact is addressed by participants themselves. If increasingly severe dysarthria is characterized by cascading troubles then clinicians and academics need to understand how such difficulties arise and how they are repaired. The findings have relevance to the theoretical constructs of communication disability as well as the practical understanding what goes wrong in...
dysarthria-in-interaction and how it might be resolved. This has a direct link to the development of new assessment and treatment approaches in speech-language pathology, particularly in the area of trouble source management.

Methods

The data presented here were obtained as part of a larger study examining talk between people with progressive neurological diseases and family members. Approval for the study was awarded by a UK National Health Service (NHS) Research Ethics Committee. People with clinically diagnosed cognitive and/or language disorders were excluded from the study. In the present study, analyses are based on three extracts obtained from one dyad’s data set.

Data Collection and method of analysis

The dyad described below volunteered to participate in a study examining the effects of acquired dysarthria on everyday conversation. They were recruited through their local NHS speech and language therapy service.

The couple were loaned a Sony Handycam Video 8 CCD-TR330E Camcorder with a portable tripod. The able-bodied partner was then instructed in the camera use with an additional short written operating guide. The filming equipment use was rehearsed with a brief recording practice. They were asked to record themselves in the participant’s nursing home room for approximately 30 minutes within an agreed one-week sampling period. It was requested that the recording take place during a regular opportunity for everyday conversation (e.g. during the mid-morning or mid-afternoon coffee time). This process was repeated at three monthly intervals (+/- one week) over a 12-month period. In total four video recordings were made. Each recording was
collected by the researcher and digitized to a .mov format for repeated viewing using QuickTime Player 7 software.

One hour and 48 minutes of recordings were subjected to conversation-analytic transcription (see Hepburn and Bolden, 2017) by the first author. Transcription depicted the timing and sequencing of talk, literal content (e.g., words and non-lexical vocalisations), and aspects of prosody and intonation, as well as non-verbal movements (e.g. facial expressions and body orientation). A sample of transcriptions was checked for reliability by a member of the research team and through data sessions with colleagues experienced in CA.

Recordings and transcripts were then examined for instances of other-initiation of repair which were not resolved immediately by a next turn self-repair and thus necessitated more than one other initiation of repair. Each multi-turn other-initiation of repair sequence was subjected to detailed analysis. The three extracts presented below have been selected in order to provide insight into specific features of multi-turn other-initiated repair and to throw light onto the potential difficulties encountered for both participants when a first attempt other initiation of repair is unsuccessful.

Participants

The participant couple are identified in the text by the pseudonyms: Alex and Molly. Alex is a 38-year-old English speaking computer programmer. Molly is his mother. Approximately one year prior to data collection, Alex was diagnosed with amyotrophic lateral sclerosis/ motor neuron disease (ALS/MND). The symptoms of his ALS were reportedly emerging at least a year before diagnosis. Alex has significantly impaired motor speech abilities (dysarthria) and both upper and lower limb mobility problems. His is unable to make any purposeful movements with his arms, hands or legs. He
neither reports nor displays any language or cognitive difficulties. His speech is characterised by marked respiratory, phonatory, resonatory and articulatory weakness. At the point at which the extracts below were recorded, Alex’s Frenchay (Enderby and Palmer, 2007) conversation intelligibility subsection rating is grade ‘d’ (‘occasional words decipherable’), and his ALS Severity Scale (Hillel, Miller, Yorkston et al., 1989) rating is 5, described as ‘speech is slow and laboured; extensive repetition or a ‘translator’ is commonly used; patient probably limits the complexity or length of messages’. He has been living in a nursing home for six months prior to data collection. Of the four video recordings made over a one-year period, Alex is able to use natural speech and facial gestures for the first two recordings. For the second two recordings in months 6-12 he utilises a text-based communication aid with accompanying facial gestures.

The talk of Alex and Molly is unusual in that it is characterised by regular sequences of multi-turn utterances. In lay terms, Alex either produces individual letter names or words for Molly to repeat in the next turn position (Bloch, 2005). This is not primarily associated with repair (i.e. letter names are not produced to repair a prior trouble source) but rather a collaborative approach to talk that reduces the inherent risks of attempts at full words or phrases being produced with increasingly dysarthric speech (Bloch and Beeke, 2008). That is, full utterances in a single turn run the risk of being unintelligible, so in re-doing each of Alex’s incremental contributions to the utterance, Molly not only displays her understanding on a turn-by-turn basis but also provides an opportunity for Alex to confirm or reject her understanding of each utterance part. One specific gesture is also worth mentioning here. Alex regularly uses a lower lip movement to the left to signal agreement or confirmation. This was conventionalised by Alex and Molly as his speech deteriorated and was shared with all new interactants.
The data presented below are all from video recording two, in the first six months of the data collection period. At this point Alex is still able to use natural speech but there is evidence of increasing problems with intelligibility, even of single letter names.

**Analysis**

There were numerous other initiations of repair produced by Molly throughout the data. In what follows we examine some of the ways that Molly uses other initiation of repair in dealing with the problems that arise in her interactions with Alex. We note that she uses other initiation of repair to transition from utterance construction to turn-by-turn talk. This is used to confirm Alex’s contribution to the interaction and also to set up the trajectory for further talk. However, these extracts also show that the way Molly formats and develops these other initiation of repairs can introduce further problems for the interaction. We also consider how these troubles are resolved.

Immediately prior to Extract 1a Alex has complained that his eye-cream has not been administered as expected by the nursing home staff. Molly begins with an agreement (line 01).

((Insert Extract 1a around here))

At line 03, Molly offers a reported account addressing Alex’s complaint. The account appears to contradict the grounds for Alex’s complaint, suggesting that the nurses have indeed administered the cream. Molly then offers a possible explanation, querying whether the cream might have been applied when Alex was asleep. Alex rejects this explanation with a head shake (line 07) and initiates the next sequence of talk with an
utterance constructed with Molly over a number of turns (lines 09 to 45): ‘I am a liar’.

We are cautious of making assumptions about Alex’s intentions but one possible interpretation is of a potential attempt at sarcasm by invoking blameworthiness for the contradictory accounts of the (non-)application of the eye-cream.

Molly begins to successfully synthesise the utterance at 46 (note Alex’s smile in overlap) and produces an interpreted voicing of the whole utterance ‘you’re a liar!’.

This turn simultaneously accomplishes the construction of the utterance and, possibly, other-initiating repair, or marking the newsworthiness/humour of the assertion and encouraging further talk on the topic. Molly now offers a less equivocal other-initiation of repair using an alternative question. It targets the problematicity of the you in the turn she has developed with (and on behalf of) Alex.

((Insert Extract 1b around here))

Molly’s alternative question (‘you’re a liar or they’re a liar’) at line 53 exploits an ambiguity in Alex’s utterance, and addresses how it should be taken up. The individual words have been shown to be intelligible, but Molly is seeking clarification as to the target of the allegation. At the same time, Molly uses the cloak of repair to effect a tease of Alex by zeroing in on this possible (but not plausible) source of ambiguity, i.e., Alex is highly unlikely to be earnestly describing himself as a ‘liar’. In response Alex smiles (line 54), orienting to the teasing aspect of Molly’s action. Just as Alex’s mouth widens (56) Molly begins a turn, saying ‘I’ll sort it out after this’ (line 57).

The most likely reference here is Alex’s complaint about the eye cream, with a temporal reference to ‘after this’ being the video recording session. This turn claims a future action regarding Alex’s complaint and also closes down the repair opportunity space.
(Schegloff, 1992), treating Alex’s smiling response to her other-initiation of repair / tease as adequate for the interaction to progress.

However, just before Molly’s turn completion in line 57, Alex produces a vowel initiated vocalisation. This is not a clear production, but it is possible that Alex is saying ‘I am’ in this turn as the selected alternative from Molly’s alternative question. If so, Alex appears to be offering a confirming repair solution in response to Molly’s other-initiation of repair. Molly proceeds to voice ‘me’ as a spelling outcome at the beginning of line 69. It is then the latter half of Molly’s turn in line 69 that reveals her understanding of Alex’s prior utterance action.

Molly’s turn ‘me (0.2) you will’ (line 69) is followed by a short pause before Molly translates the pronominal reference, signalling a shift from a voicing of Alex’s talk to the authoring of her own action. The ellipsis in ‘you will’ links Alex’s utterance with Molly’s assertion at 57, i.e., ‘I’ll sort it out’. With this other-initiation of repair, Molly is displaying a hearing of Alex’s talk as being linked with her assertion rather than as a response to her prior other-initiation of repair at 53.

Alex begins a very slight head shake (line 71), and Molly produces an upgraded other-initiation at line 72, filling in the prior ellipsis with ‘you’ll sort it out’ (line 72). Molly’s expanded other-initiation of repair receives another headshake from Alex at line 74. Alex takes the next turn and recommences collaborative utterance construction. This culminates in another other-initiation of repair from Molly at 87, which settles on ‘I am a liar’ as a candidate understanding (Heritage, 1984: 319). Molly then asks Alex if he thinks that is what ‘they are saying’ (line 91). This indicates Molly has understood Alex’s contribution as a new bit of reported speech rather than confirming her distant other-initiation of repair. The sequence concludes with Molly
offering a critical evaluation of the nursing staff, thus aligning herself with Alex’s complaint.

There are multiple sources of complexity in Extract 1. One of them is the way that Alex’s responses to Molly’s other-initiation of repair at line 53 are taken up, and its cascading effects for the interaction. The teasing nature of Molly’s other-initiation of repair provides for a response that addresses either or both the tease and the repair. Molly takes Alex’s smile as constituting a complete response in its own right, and as prioritising the teasing aspect of her action. However, it seems that Alex revised his smile into a preliminary to a turn-based response (i.e., ‘I am’), but his turn came after Molly had already closed the repair sequence. This then set up a trajectory in which his attempt to participate in the repair sequence was heard as contributing to another sequence altogether. Critically, then, Alex’s apparent ‘me’, which is voiced by Molly at the start of line 69, is transformed into a ‘you will’ that contributes to the ‘I’ll sort it out after this’ sequence. Alex rejects Molly’s treatment of ‘me’ as indicating that he will sort out the problem, initially via head shakes (lines 71 and 74). He then goes on to repeat his prior talk ‘I am a liar’, which successfully enables them to return to the complaint topic (but not to the prior repair sequence). Molly does not openly disagree with what Alex has said at this point, but she does use next turn to establish the action of the turn (reported speech), and then proceeds to display alignment in part with Alex’s complaint – ‘I don’t think um half of them know what the other half are doing’ (line 92).
Extract 2 immediately follows Extract 1b. As part of addressing Alex’s complaints about the nurses not having applied his eye cream, Molly turns the topic to a medicinal patch.

The sequence begins with Molly’s attempt to close the complaint talk down through a proposal regarding this patch. Alex follows with a number of indistinct syllables, which Molly anticipatorily completes with a candidate understanding other initiation of repair: ‘want one on both sides?’ (line 16). In doing so, Molly treats the utterance she and Alex developed between lines 6 and 14 as modifying her proposal: from a patch on one side of his neck, to a patch on both sides.

As Molly produces her other initiation of repair, Alex shakes his head in terminal overlap and continues with the vocalisation ‘ar:: a: one’. The head shake could be treated as a negation to the candidate as in ‘no I don’t want one on both sides’, or it could be treated as an other initiation of repair in its own right, signalling a broader trouble in all or part of the prior turn. The understanding that Molly displays in line 19 is that ‘both sides’ is incorrect. Molly’s following, other-initiating turn ‘you want one’ (line 19) recognises that there is some hitch. As we shall see, Alex has not said the word ‘want’ at all, but is it proving difficult for him to exert adequate control over his vocalisations at the required level of detail.

1 ‘Patch’ refers to an adhesive strip normally placed on one side of the neck, but potentially both sides, containing medication to reduce the build-up of saliva and, in turn, minimise the occurrence of coughing and/or aspiration.
Alex’s responses to Molly’s talk at line 19 show that the problem remains. He
shakes his head and produces a two-syllable utterance. Molly then produces ‘one’ (line
23) followed by Alex’s single syllable to which Molly offers a candidate letter of ‘en?’
(line 27). In line 29 Alex shakes his head and produces what sounds like a repeat of his
prior turn, which is more clearly akin to the word ‘and’, and Molly takes it up in this
way in line 31. Molly and Alex continue collaboratively developing this utterance
between lines 33 and 37.

Molly offers a candidate understanding other-initiation of their shared work at line
39 with ‘one and a half?’. Molly’s other-initiation suggests that she has understood this
as a complete utterance. In addition, the lexical continuity of the word ‘one’ may have
encouraged her to hear it as relating to the patches. However, Alex and Molly then add
the word ‘days’ before Alex produces a confirmatory lip movement (line 45).

It is possible that the lip movement is being used here to signal an end of utterance,
with ‘one and half days’ complete enough that Molly will now be able to respond to it.
This is supported by the silence at line 46, where neither Alex nor Molly make any
moves to develop the utterance further. Instead, Molly employs another action
relevant at possible utterance completion: she other-initiates repair by offering a
candidate understanding of the topic, i.e., ‘what your (.) the cream we’re on about
↑now still?’ (line 48). By ending her turn with ‘still’ there is perhaps an indication that
the topic of cream is one that has passed, or is at least one that Molly has now moved
on from herself. Alex’s lower lip movement following ‘cream’ appears to confirm that
his utterance should be heard as contributing to his earlier complaint and not the more
recent patch proposal. Molly’s other-initiation of repair also abandons her focus on
Alex’s as wanting something, as per lines 16-19. Instead, she introduces the possibility
that Alex was accomplishing some other action between lines 6 and 43.
Following Alex’s confirmation of ‘cream’ he produces ‘es’ (line 51). This is a likely repeat of his overlapped and subsequently abandoned turn initiation at line 47. A word is then collaboratively spelled aloud culminating in Molly’s production of ‘since’ (line 76). Alex’s response to this is a clear lower lip movement followed by Molly’s turn ‘one and a half’ (line 80), a recapping of the prior talk. Molly then adds ‘since’ (line 82) bringing both participants to the most current understanding of prior talk. In line 84 Alex now produces a one syllable utterance that Molly interprets as ‘this’. Alex then produces a very quiet aspiration which is followed by Molly offering a check on her prior understanding through the production of ‘no?’ (line 90). There is then a silence before Molly produces a further topic clarification other initiation of repair ‘are we talking about cream or are we talking about patches’. During the production of ‘cream’ Alex move’s his lower lip down. Molly then initiates an additional other initiation of repair with a more targeted polar response ‘cream?’ (line 95). Alex’s response here is to close and open his eyes, treated by Molly as confirmatory.

In summary, Alex’s eye-cream complaint is shown to proceed but with considerable disruption to progressivity. A major issue here is the limited local scope of other initiation of repair itself. Sequentially it can only reach back so far. In Extracts 2a and 2b Molly does manage the repair by using other initiation of repairs that formulate the topic. Difficulties are compounded by the fact that Alex has limited resources for self-repair at his disposal. A head-shake can signal a negation of the prior turn but it cannot specify the nature of the trouble. Thus, the ‘want one’ turns out to
be an incorrect interpretation within a larger turn construction but Alex is unable to locate it specifically.

In Extract 3, Alex evaluates his coffee as ‘awful’ and Molly offers to make him another one later. Alex then makes an enquiry: ‘where from?’. Molly treats this turn as relating to where the second coffee will be made, but it transpires that Alex is asking where the first (awful) coffee came from. As with Extracts 1 and 2, Alex’s turn is misunderstood by Molly despite her use of other-initiated repair. The trouble again arises from the way that Molly links Alex’s talk with the surrounding sequential environment, and Alex’s limited ability to effectively position his own talk.

((Insert Extract 3a around here))

This sequence begins with Alex drinking coffee. Following his subsequent talk at line 06, Molly initiates repair with ‘it’s what?’. Alex’s self-repair, accompanied by a smile, is receipted by Molly as ‘awful’ together with her own appreciation of his critical (but non-serious) stance. She then offers Alex a ‘decent one’ later.

Whilst Molly is walking around the bed, Alex produces two syllables and a further syllable as she sits down. Molly now other-initiates using an open format ‘mm?’ (line 23). There follows a period of joint utterance construction culminating in a candidate understanding from Molly at line 46, ‘where from?’. Her answer—‘your coffee making machine’—specifies how Molly will make Alex’s better tasting coffee later on.

With this response, Molly is displaying an understanding of Alex’s talk as tied to her offer. As Molly produces her response at line 49, Alex interrupts with overlapping talk. His overlapping turn comprises an elongated vowel sound and lip movement, followed by a slight head shake.
Molly now other-initiates repair with a candidate understanding in line 52 ‘no good?’, which she develops further in line 55 ‘is that awful as well?’ These other-initiations of repair treat Alex’s turn as accomplishing further negative evaluation; in this case, targeting his own coffee making machine’s output.

There is an opportunity now for Alex to confirm his negative evaluation of his coffee machine. However, at this point he shakes his head. Alex and Molly proceed to produce ‘where do they’ (lines 59 to 75) before Molly anticipatorily completes Alex’s turn construction with: ‘where do they get the coffee from’ (line 77). This turn begins with a laughter token, contains laughter within the turn, and receives reciprocal laughter from Alex in overlap.

The difficulty we have focused on in Extract 3 comes to be visible around Alex’s ‘where from’, which is collaboratively produced between lines 20 and 46. Molly treats this as a question asking where she will be making Alex’s decent cup of coffee (as offered at line 15). Subsequent talk by both participants reveals this treatment by Molly as incorrect. ‘Where from’ is actually produced by Alex as an expansion to his evaluation of the coffee as ‘awful’; something along the lines of ‘where do they get this awful coffee from’. It is unclear whether this is turn is more like an information-seeking question, an assessment, or something in between. Molly treats it as something in between through her smiles, laughter, and candidate answer ‘cheap shop’ at line 80.

The first point at which Alex might try to signal problematic uptake by Molly is immediately after her answer ‘your coffee making machine’ (line 49). Indeed, whilst
Molly’s turn is being produced, Alex attempts to speak, closes his eyes and shakes his head slightly. This is consistent with third-turn self-repair (Schegloff, 1997), with Alex acting to resolve the misunderstanding caused by his own talk in line 46. Molly’s other-initiations of repair in line 52 and 55 are sensitive to the problems Alex is indicating, but find their grounding in the immediate sequential environment; that is, Alex’s turn and her own misunderstanding of ‘where from’. This means that her candidate understandings build these features of the local sequential environment into their design, filtering Alex’s conduct through them. As a consequence, Molly renders Alex’s turn at 50 as a negative evaluation of his own coffee machine.

The ambiguity of ‘where from’ strongly influences how Molly navigates through these moments. Its ambiguity arises from two sources. The first is its positioning within the ongoing talk. The eventual, collaborative production of ‘where from’ occurs quite some distance from the turn to which it is sequentially linked, i.e., line 11. It is possible that Alex began his first attempt at this utterance in line 12, following Molly’s voicing of ‘awful’. In many instances Alex begins a turn with some form of voicing initiation before moving onto the production of intelligible word or letter names. This is a result of both respiratory and phonatory weakness. In this case, Alex initiates an elongated vowel sound before his production is overlapped by Molly’s ‘make’ (line 13). Both participants then pause and it is Molly who then restarts with ‘make you a decent one later’. In doing so, Molly transforms the sequential context in which Alex has attempted to insert his talk, commencing the increasingly substantial displacement between Alex’s utterance and its predecessor.

The second source of ambiguity comes from the design of the turn itself. The elliptical nature of ‘where from’ strongly invokes prior talk, both in terms of reference and in terms of sequence (see, e.g., Fox and Thompson, 2010). It furthermore encourages Molly to hear Alex’s turn as accepting the terms of the prior talk, and ‘a
decent one’ is the most proximal, unproblematic noun phrase in the most proximal (non-minimal) action of the sequence. An enquiry about the source of a decent coffee would also add further, more specific information to that already provided. This also means that a link between ‘awful’ and ‘where from’ is less straightforward to establish, particularly in the absence of indications via embodiment (e.g., gaze, pointing) or prosody, both of which are difficult for Alex to accomplish. That is, he is unable to direct Molly’s gaze to the coffee given that the cup has been removed from view, and he is unable to signal fine prosodic control linking ‘where from’ to ‘awful’. Given this restriction, Alex’s ability to reference is restricted in this instance to the semantic meaning of turn content and the sequential placement of that turn within the ongoing talk.

Discussion

This study explored cascading other-initiated repair sequences in dyadic everyday conversations involving a man with severe ALS dysarthria and his mother. We examined how Alex and Molly managed other-initiatives of repair, and how their talk featured multiple troubles and repair attempts. Particular attention was drawn to problems in sequential understanding. The evidence presented here is that the participants were able to (in some way) resolve their troubles, but it required extensive work to both identify the trouble source and to unravel the problem to reach a satisfactory understanding. This contrasts with earlier findings relating to speakers with Parkinson’s disease in which opportunities to repair talk that is compromised in terms of intelligibility by overlap are often not pursued (Griffiths et al. 2012). Alex’s physical restrictions were seen to play an important part in his ability to position his
talk in sequential context and successfully accomplish self-repair; particularly, third-turn repair.

**Uses and scope of other-initiation of repair**

In each of the extracts presented, we have seen some core ways that Molly uses other-initiation of repair in dealing with the problems that arise in her interactions with Alex. In particular, we have seen that she uses other-initiation of repair to transition from utterance construction to turn-by-turn talk (e.g., Extract 1 line 53, Extract 2 line 39, Extract 3 line 46). This is an important moment for confirming Alex’s contribution to the interaction and setting up the trajectory for further talk. However, these extracts also indicate that the way Molly formats and develops these other-initiations of repair can introduce further problems for the interaction. One reason for this is the intrinsically limited scope of other-initiation of repair, which typically reaches back into immediately adjacent turns in the same sequence of talk (e.g., Ekberg, 2012; Robinson, 2014). The local scope of most other-initiations of repair—especially the more ‘closed’ format types Molly employed—subsumes apparently unproblematic aspects of sequential context. The instability of sequential context and intersubjectivity in Alex and Molly’s interactions mean that this feature of other-initiations of repair can be troublesome when Molly’s inferences about sequential relationships differ from the relationships Alex had been targeting. Molly’s other-initiations of repair therefore have the potential to refract the direction of the talk, adding yet another layer to the—already complex—problems implicated by Alex’s dysarthria.

We have also seen in Extract 2 that Molly can strategically use formulation-like other-initiations of repair in which she offers candidate understandings of the topic for confirmation from Alex. This practice is advantageous in that it allows Molly to address prior talk more coarsely, which may mitigate the risk of refracting sequential context.
via other-initiation of repair, as outlined above. However, it halts talk more firmly, and, as per Molly’s conduct in Extract 2, may be used only as a last resort in addressing persistent problems.

**Sequential positioning and self-repair**

Alex’s inability to position his talk sequentially and effectively self-repair also forms part of the story here. On the first point, the timing of Alex’s turns regularly contributed to Molly’s misattribution of the relevant sequential context. Timing is clearly a major factor with reference to AAC output (Clarke and Wilkinson, 2010), but far less attention has been paid to the effects of timing on dysarthria-in-interaction. For instance, in Extract 1, Alex visibly prepares to speak at line 56 with what turns out to be a second pair part response to Molly’s prior turn, but what he does is overwritten by Molly’s ‘I’ll sort it out after this’. His speech itself is only audible at the very end of Molly’s turn, and he essentially misses the moment in which his turn is most likely to be heard as related to its target in line 53. Issues of sequential positioning are also created by Alex’s sparse utterances. Explicit indications of sequential relationships are accomplished using turn beginning elements (e.g., conjunctions; see Scheglof, 2004; see also Barnes, Ferguson, and Candlin, 2013, on aphasia), which are regularly not included in Alex’s turns. On the second point, it is also clear that Alex’s limited semiotic resources contribute to ambiguous resolutions of other-initiated repair sequences, and can prevent him from effectively addressing problematic uptake of his turns in third turn position. In addition to his inefficient access to lexical and grammatical resources, gestures, facial expression and prosody are all restricted, leaving Alex with various confirmatory responses (e.g., head shakes, downward lip movement), collaborative word output, and other “negative” evidence (e.g., lack of response) to form communicative actions. These resources are broadly ill-suited to the
kinds of fine adjustments required for repair solutions, compounding his dependence on timing for building sequential relationships.

Anticipatory completion

Previous work has identified the practice of anticipatory completion as one way in which Molly proposes an as yet to be completed word in progress (Bloch, 2005, 2011).

The potential benefit of such a completion by other is one of efficiency: it saves Alex respiratory and articulatory effort by not having to say aloud every element of a word. In the data presented here we see anticipation of utterances in progress. This can certainly work well, as in Extract 3 line 77 – ‘where do they get the coffee from?’ but other completion of talk in progress can also be incorrect as in Extract 2 ‘want one on both sides?’ (Molly: line 16). The consequences of an incorrect completion are shown to be significant.

Intelligibility and understandability

With reference to the nature of the troubles observed we note that the relationship between intelligibility and understandability is both intimate and complex. There remains no doubt that variable intelligibility sits at the heart of dysarthria. Alex’s adapted turn design featuring individual letter names, for example, is only being used because his speech is becoming increasingly unintelligible. However, if (un)intelligibility were the only problem we would not expect the ongoing difficulties displayed by the participants. What Molly displays are troubles with intelligibility combined with understanding difficulties: ‘I am a liar’, ‘one and half days’ and ‘where from’ are all, eventually, shown to be intelligible but they do not prove understandable until additional repair work is undertaken. The nature of these difficulties relates to
the sequential relationship between turns, the timings of Alex's turn initiations and the
design of Alex's turns themselves.

It is important to recognise the limitations of this work. The study is limited by
focusing on data from one dyad and from one data collection point. Analysis of multi-
turn other-initiated repair sequences may have been enhanced through a larger sample
set to identify systematic practices across a number of environments. Future research
should consider how repair practices change over time in the face of a deteriorating
disease.

In conclusion, other-initiated repair is a fundamental mechanism for managing
troubles associated with unintelligible or partially intelligible speech. Individual
dyads, such as Alex and Molly, may develop new practices in interaction to minimise
the problems associated with moderate to severe dysarthria. However, as the severity
of the dysarthria increases further and intelligibility becomes even more challenging,
repair itself is seen to become more complex. The interactional moments presented
in this paper reveal an important limitation of other initiation of repair —certainly for
Molly and Alex but likely for other plwALS too — namely, its grounding in an
apparently unproblematic sequential context. The degree of instability in mutual
understanding that dysarthria can cause is important for developing speech pathology
assessment and intervention strategies focused on everyday communication. Such
strategies should be underpinned by accounts of the conversational problems caused
by ALS, and the ways that they relate to self- and other-initiated repair practices
dedicated to dealing with them. The present study has offered a depiction of layered
conversational problems that other-initiation of repair may not completely resolve or,
in some cases, multiply.
Mapping the relationships between conversational problems and other-initiation of repair practices will likely be vital for developing enchronically-valid clinical resources for dysarthria, i.e., clinical resources that directly and empirically capture the real-time accomplishment of communication (see Barnes and Bloch, 2019). Future studies systematically examining other initiation of repair and associated sequences over time, and tracking its evolution in line a with deterioration in speech and the adoption of communication aid systems, are likely to be conceptually and practically helpfully for developing novel clinical resources. This may encompass new assessment tools that capture the behaviours of both communication partners, not just those of the person with dysarthria. New CA informed treatment packages for people living with dysarthria might also be developed, with a focus on improving how trouble sources are managed and resolved with reference to evidence from published studies but also from dyads themselves, particularly those who display creative ways of dealing with the impact of deteriorating intelligibility through their interactions. Exploring the degree to which existing conversation interventions for people with aphasia (Beeke et al. 2015) might be utilised for people with dysarthria is now underway, with potential for a generic communication disability intervention approach that targets facilitators and barriers in conversation without the technical demands of conversation analysis as a formal research tool.

References


Extracts

Extract 1a

001 M no I know
002 (0.4)
003 M um (.) but she did say: as far she knew (0.4) you’d had it this morning
004 according to the night staff when they handed over.
005 (4.8)
006 M didn’t do it when you were asleep.

007 A [(shakes head)]

008 (0.8)
009 A ((turns head to M and opens mouth)) (#I:: um)
010 (0.2)
011 M I am,
012 (0.9)
013 A ahh
014 (0.2)
015 M a,
016 (1.4)
017 A (o: har)
018 (0.2)
019 M o: aye,
020 (0.7)
021 A ((very slight head shake)) #ar::hhh
022 (0.4)
023 M o:
024 (0.2)
025 A ((slight head shake)) (hhhe ehye)
026 (0.4)
027 M o:=
028 A =((slight head shake)=
029 M =EL?
030 (0.6)
031 A #eyhe
032 (0.3)
033 M eyhe,
034 (0.6)
035 A (%a%)
036 (0.5)
037 M kay
038 (0.4)
039 A ((slight head shake)) (ah::)
040 (1.0)
041 M [ei eye,]
042 [(moves closer to A)]
043 (0.7)
044 A (a: arhhh:)
045 (1.5)
046 M a: ar: (0.3) [liar?l]
047 A [((smiles))]
048 (0.5)
049 M you’re a liar!
050 (0.2)
051 M o:h-.hhh=
Extract 1b

052 A =((looks over to TV))

053 M £you’re a liar or [they’re a liar£

054 A [((looks back to M)) ((smiles)) “he”

055 (0.9)

056 A ((opens mouth slightly)) [((opens mouth wider))

057 M [I’ll sort it out after th£is. ]

058 A [ (I:em)

059 (0.3)

060 M em,

061 (1.0)

062 M em?

063 (0.4)

064 A (e:hhh)

065 (0.6)

066 M ee:?

067 (0.8)

068 A ((smiles))=

069 M =me (0.2) you will

070 (0.8)

071 A ((slight head shake))

072 M [you’ll sort it out]

073 (0.2)

074 A ((slight head shake))

075 (2.9)

076 A (#iyum)

077 (0.5)

078 M I am?

079 (0.4)

080 (0.2)

081 A a-hhh

082 (0.2)

083 M a,

084 (0.5)

085 A (2 syllables)

086 (0.4)

087 M I am a [£what? £] a liar!£

088 [((smiles)) ]

089 (0.2)

090 A ((smiles))=

091 M =id’ you think that’s what they’re saying£?

092 (0.4)

093 A ((looks over to TV))=

094 M =I don’t think um half of them know what the other half [ are doing ]

095 A [ aha: ]

096 (0.5)

097 M you remind me to put your patch on

098 (1.0)

099 A ((looks back to M))=

100 M =when this is finished.
Extract 2a

001  M you remind me to put your patch on
002       (0.9)
003  A ((looks to M))=
004  M = when this is finished.
005       (0.6)
006  A (1 syllable) (2 syllables)
007       (0.4)
008  M one,
009       (1.1)
010  A (1 syllable)
011       (0.2)
012  M on,
013       (1.0)
014  A ♪:
015       (0.3)
016  M want one on both [sides? ]
017  A [ (slight head shake) ] (ar:: a: one)
018       (0.2)
019  M you want one,
020       (0.2)
021  A (slight head shake) (2 syllables)
022       (0.2)
023  M one
024       (0.6)
025  A (1 syllable)
026       (0.4)
027  M en?
028       (0.2)
029  A (slight head shake) (a::nd)
030       (0.3)
031  M and?
032       (1.3)
033  A a-hhh
034       (0.2)
035  M a
036       (1.0)
037  A half
038       (0.2)
039  M > one and a half? <
040       (0.4)
041  A (1 syllable)
042       (0.2)
043  M days
044       (0.2)
045  A (moves left lower lip down)
046       (1.3)
047  A [ (es) ]
048  M [ what ] your (. ) the cream [ we ’ re on ] about now still?
049  A [ (lower lip mvt) ]
Extract 2b

050  (0.4)
051  A  (es)
052  (0.4)
053  M  es?
054  (1.0)
055  A  "eye"
056  (0.2)
057  M  eye,
058  (0.3)
059  A  #en
060  (0.2)
061  M  en
062  (1.0)
063  A  ((coughs))=
064  M  =es eye en,
065  (0.5)
066  A  ((coughs))
067  (0.4)
068  M  es eye en,
069  (0.3)
070  A  ((mouths t))
071  (0.2)
072  M  tee?
073  (0.2)
074  A  "(slight head shake)"
075  (1.2)
076  M  since,
077  (0.3)
078  A  "(moves left lower lip down)"
079  (0.7)
080  M  one and a half?
081  (0.7)
082  M  since
083  (0.5)
084  A  "(1 syllable)"
085  (0.8)
086  M  this,
087  (0.8)
088  A  "hm:"
089  (0.3)
090  M  #no?#
091  (0.7)
092  M  >&are we talking about the cr[eam]< or are we talking] about patches.
093  A  [(lower lip down)]
094  (0.5)
095  M  cream?
096  (0.2)
097  A  "(closes and opens eyes)="
098  M  =ye[ah]
099  A  [mm]:
Talk continues with Alex’s complaint that it has been one and a half days since he has had any eye cream.

Extract 3a

001 A (drinks coffee from cup held by M and then directs gaze to M)
002 M enough?
003 A =((nods))
004 M (moves cup away from M’s mouth)
005 (0.6)
006 A (2 syllables) (swallows) (2 syllables)=
007 M =((wipes A’s chin)) it’s what?
008 (0.4)
009 A (awf)
100 [((smiles))]
101 M awful! (. “ht
102 A [1 syllable]]
103 M imhay=ke
104 (0.4)
105 M >imake you a dehceent one later<
106 (0.4)
107 M alright? ((stands up from sitting beside A and moves away from view))
108 A mm
109 (4.4)
110 M Imhay=ke
111 (0.8)
112 M "start agin"
113 (0.3)
114 A (1 syllable)
115 (0.7)
116 M where?
117 A (moves lower lip down)
118 (0.5)
119 M where?
120 (0.7)
121 A (frm.hhh)
122 (0.8)
123 M where,
124 (0.3)
125 A (from .hhh)
126 (0.9)
127 M ↑from?
128 (0.8)
129 A (moves lower lip down and smiles)
130 (0.2)
131 M where [from? ]
132 A [((expands smile)]
133 (0.5)
134 M your coffee (. m:aking machine]
135 A [arh: ((moves lips to side)) ] ((slight head shake))
Extract 3b

051  (0.4)
052  M  na good?
053  (1.0)
054  A  (1 syllable) [(1syllable)]
055  M  [is that ] awful as well?
056  (0.2)
057  A  ((shakes head))
058  (1.0)
059  A  (1 syllable)
060  (0.4)
061  M  where
062  (0.4)
063  A  (2 syllables)
064  (0.6)
065  M  where are?
066  (0.2)
067  A  mhh(.)(deeyo)
068  (0.2)
069  M  deo:
070  (0.2)
071  M  where do,
072  (0.2)
073  A  the-hay
074  (0.3)
075  M  they,
076  (0.6)
077  M  huh ?where #do they ghet [the coffee fir-hom£ ]
078  A  [(smiles)] tche
079  (0.6)
080  M  fcheap [shop uh£]
081  A  [ar:: ] ar